Future Aircraft Carriers

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CVN 21 Program Manager

Aircraft Carrier Technology Small Business Opportunities Breakfast

22 June 2004

Opportunities

- **All Maturity Levels -**
  - Existing Fleet of 12 Carriers and other naval ships
  - New ship under construction (CVN 77) with a 50 year service life
  - New ship class under development (CVN 78) for multiple hull
- **All Technology Areas –**
  - Carriers represent a floating city of 5000 people
  - With a military airport including 80 highly complex aircraft
  - Operating as the centerpiece of the Carrier Strike Group
- **All Improvements –**
  - Increased efficiency (reduced manning, reduced maintenance, etc)
  - Increased effectiveness (greater through-put, Improved bandwidth management)
  - Reduced Life Cycle Costs
  - Reduced weight, power and heat

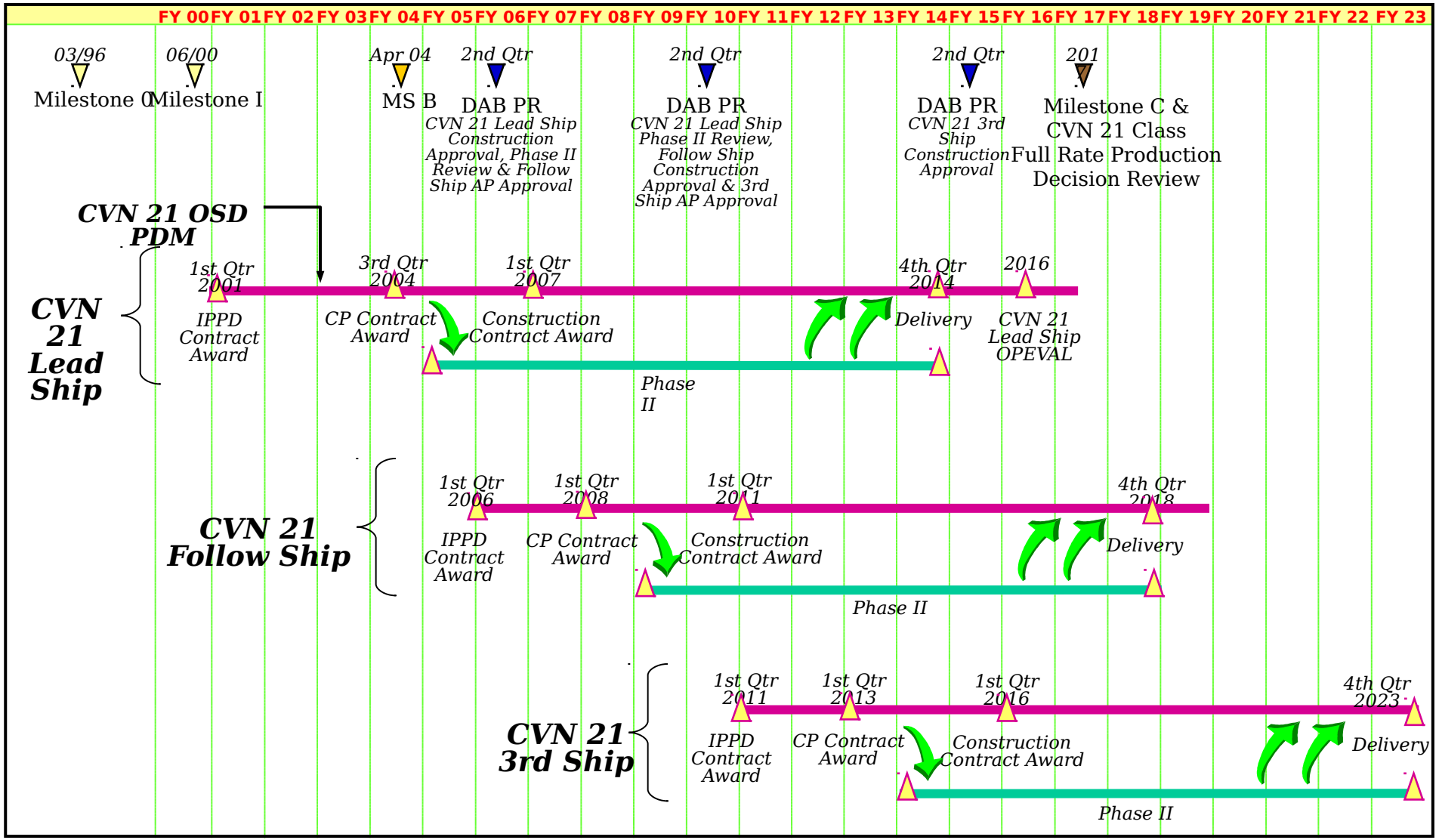
CVN 21 Program History

- **Milestone 0 Approval March 96**
- **DAB Oct 98 Authorized:**
  - Large Deck (75 Aircraft)
  - New Nuclear Propulsion and Electric Plant Design
  - Evolutionary Acquisition Strategy
- **Milestone I Approval 15 Jun 00**
- **Program Decision Memorandum signed 12 Dec 02**
  - Pull Forward Technologies Intended for CVNX 2
  - SCN Funds:
    - AP (FY04-FY06)
    - Split Full Funding (FY07 and FY08)
  - Designates Program as CVN 21
- **Revised Acquisition Strategy Approved 06 August 03**
- **Milestone B Approval 26 Apr 04**

CVN 21 Revised Acquisition Strategy
Approved 06 Aug 03

- **Single Leap Acquisition Strategy Vice Evolutionary Approach**
  - CVN 21 Follow-on Ships to be Modified Repeats
- **12 Ship Class**
  - Replaces USS Enterprise, USS Kennedy and Entire Nimitz Class
  - Last Ship Delivers 2058 to Replace CVN 77
- **Each Ship to be Contracted for Separately**
- **Each Ship to Include a Phase I / II Approach**
  - Phase I - Procures the Basic Ship, Propulsion Plant and HM&E Systems. Provides Flexible Ship Infrastructure
    - Sole Source to NGNN
  - Phase II - Integrates the Ship's Command Centers and Aviation Intermediate Maintenance Facilities Into the Ship
    - Full and Open Competition
    - Major Warfare System Components Provided by Other Navy Programs

CVN 21 Schedule


FY 00 FY 01 FY 02 FY 03 FY 04 FY 05 FY 06 FY 07 FY 08 FY 09 FY 10 FY 11 FY 12 FY 13 FY 14 FY 15 FY 16 FY 17 FY 18 FY 19 FY 20 FY 21 FY 22 FY 23
03/96
Milestone 0
06/00
Milestone I
Apr 04
MS B
2nd Qtr
DAB PR
CVN 21 Lead Ship Construction Approval, Phase II Review & Follow Ship AP Approval
2nd Qtr
DAB PR
CVN 21 Lead Ship Phase II Review, Follow Ship Construction Approval & 3rd Ship AP Approval
2nd Qtr
DAB PR
CVN 21 3rd Ship Construction Approval
201
Milestone C & CVN 21 Class Full Rate Production Decision Review
CVN 21 OSD PDM
CVN 21 Lead Ship
1st Qtr 2001
IPPD Contract Award
3rd Qtr 2004
CP Contract Award
1st Qtr 2007
Construction Contract Award
Phase II
4th Qtr 2014
Delivery
2016
CVN 21 Lead Ship OPEVAL
CVN 21 Follow Ship
1st Qtr 2006
IPPD Contract Award
1st Qtr 2008
CP Contract Award
1st Qtr 2011
Construction Contract Award
Phase II
4th Qtr 2018
Delivery
CVN 21 3rd Ship
1st Qtr 2011
IPPD Contract Award
1st Qtr 2013
CP Contract Award
1st Qtr 2016
Construction Contract Award
Phase II
4th Qtr 2023
Delivery

CVN 21 Concept Ship

ntegrated Island

Smaller Island Re-Positioned Aft & Outboard

Composite Mast with Clamp Antenna

JPALS

MFR/VSR

New Propulsion/Electric Plant

All Electric Aux Services

Zonal Electrical Distribution System

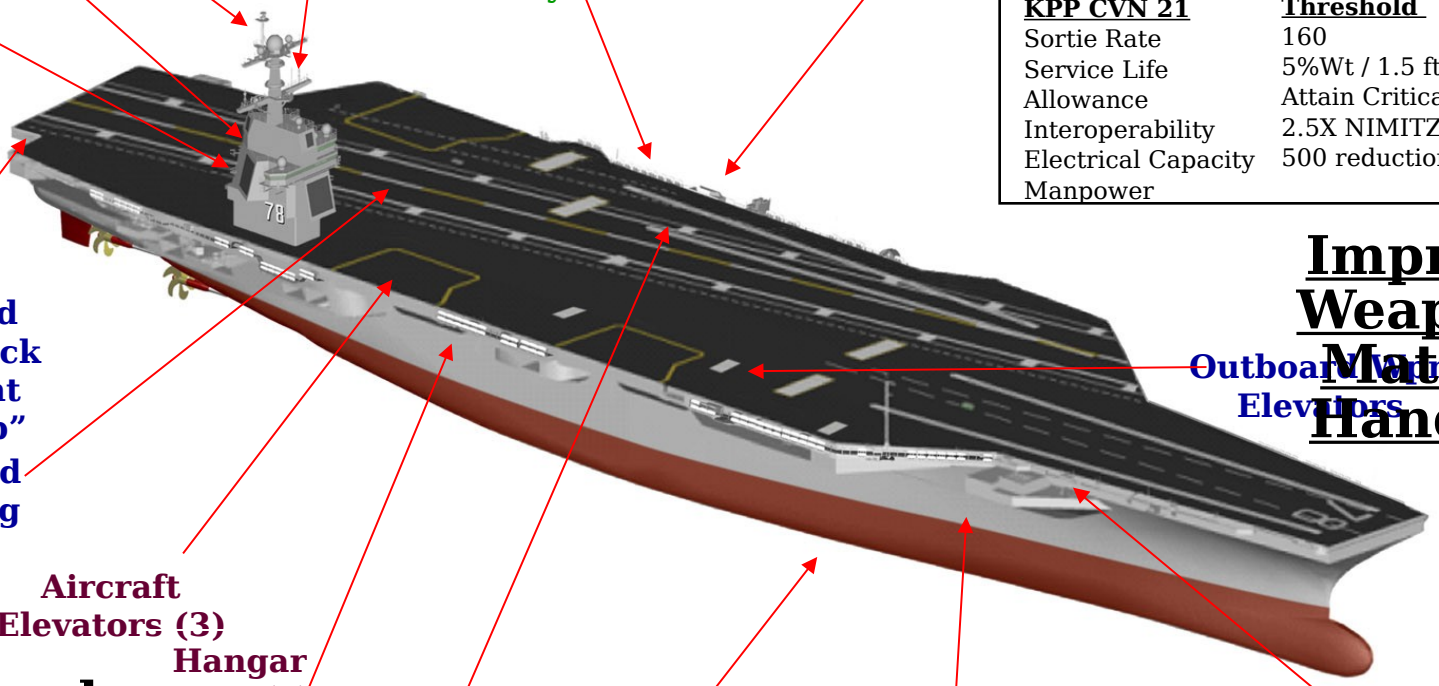
New Propulsion Plants

CVNX 1

Brought Forward from CVNX 2

NEW

KPP CVN 21	Threshold	Objective
Sortie Rate	160	220
Service Life Allowance	5%Wt / 1.5 ft KG	7.5%Wt /2.5 ft KG
Interoperability	Attain Critical IERs	Attain all IERs
Electrical Capacity	2.5X NIMITZ	2.5X NIMITZ
Manpower	500 reduction	900 reduction



Improved Weapon & Material Handling

Outboard Weapons Elevators

Heavy Unrep

Enlarged Flight Deck Footprint "Pit Stop"

Advanced Arresting Gear

Aircraft Elevators (3)

Hangar Bays (2)

Enhanced Flight Deck

4 EMALS #4 CAT Unrestricted

Underwater Protection

Dynamic Armor Protection

Improved Survivability

ESSM

Enhanced Ship Self Defense

CVN 21 Critical Technologies

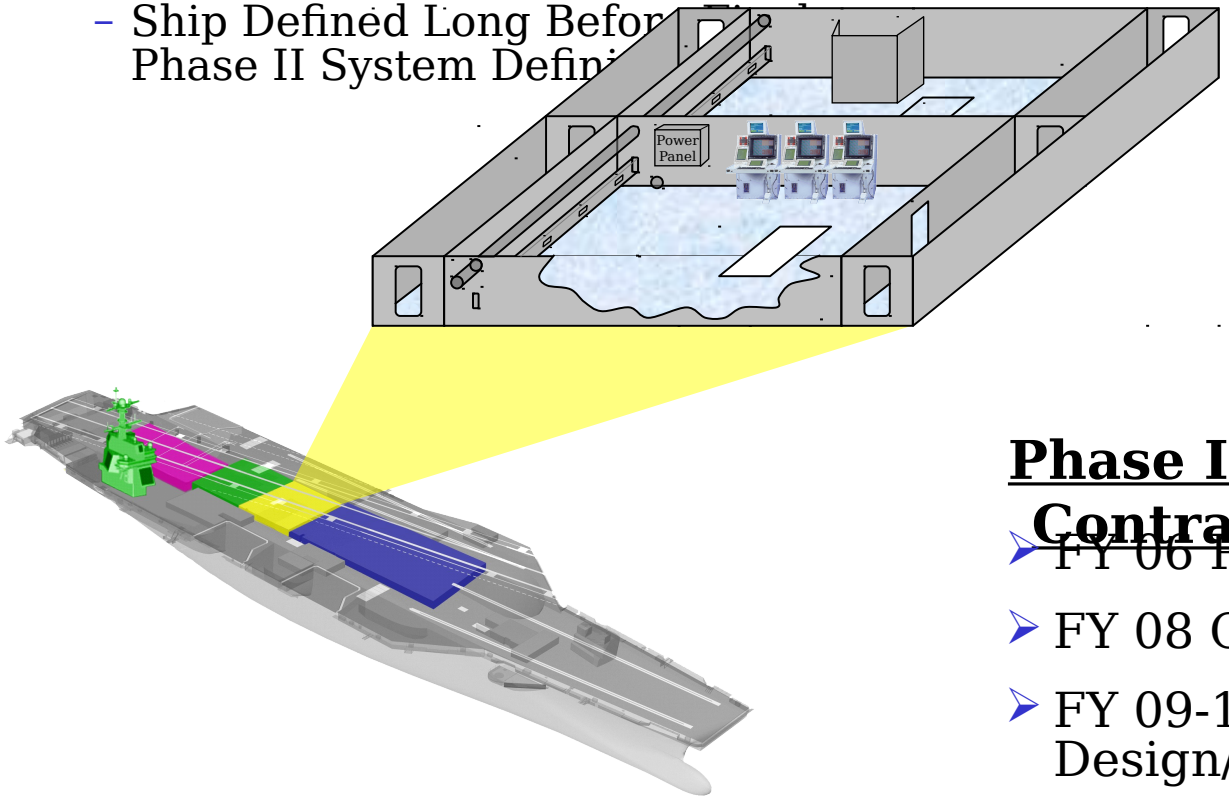
CT#	Title	Acquisition Phase	Apr 04 MS B TRL	FY 06 CDR TRL	TRL 6 Date after CDR	In Yard Date	KPP
1	Advanced Arresting Gear	I	3	4	FY 08	FY 11	1, 3
2	Dynamic Armor Protection System (DAPS)	I	4	6	N/A	FY 09	3
3	Electromagnetic Aircraft Launching System (EMALS)	I	6	6	N/A	FY 09	1, 2
4	Evolved Sea Sparrow Missile (ESSM)	II	8	8	N/A	FY 12	5
5	High Strength Alloy (HSLA) 65 Steel	I	8	8	N/A	N/A	3
6	Joint Precision Approach Launching System (JPALS)	II	6	6	N/A	FY 12	1, 2, 3, 5
7	Multi-Function Radar (MFR)	I	6	7	N/A	FY 12	1, 3, 5
8	Nuclear Propulsion/Electrical Plant	I	7	7	N/A	FY 07	1, 3, 4
9	RO Desalination System	I	7	7	N/A	FY 08	1, 3
10	Omni-Directional Vehicle (ODV)	II	4	5	FY 08	FY 14	1, 2
11	Plasma Arc Waste Destruction System (PAWDS)	I	6	7	N/A	FY 08	1, 3
12	Volume Search Radar (VSR)	I	5	7	N/A	FY 12	1
13	Automated Weapon & Material Movement Technologies	I	3	4	FY 09	FY 13	1, 2
14	Heavy Underway Replenishment (UNREP)	I	5	6	N/A	FY 09	1, 2
15	Lightweight Materials	I	8	8	N/A	FY 07	3
16	Weapons Elevator Technologies	I	4	6	N/A	FY 08	1, 2

KPP 1 - Ship's Force Manpower Reduction
KPP 2 - Sortie Generation Rate
KPP 3 - Service Life Weight and Stability Allowances
KPP 4 - Ship's Service Electric Generating Capacity
KPP 5 - Interoperability

Phase I / Phase II Concept

NGNN

- Provide Flexible Support Infrastructure
  - Ship Defined Long Before Phase II System Definition



Phase II Systems

- Integrated Warfare System
  - PEO IWS to Lead Integration Effort
- Aviation Intermediate Maintenance Department (AIMD)
  - CVN 21 Aviation IPT to Lead Integration Effort

Phase II Integration Contractor

- FY 06 Planning
- FY 08 Competition
- FY 09-12 Design/Procure
- FY 13-14 Install/Test

Reserved Space on the 03 Level for Technology Insertion

Command/Decision Center Examples

Example Requirements

4a4c. (U) Space Flexibility and Reconfigurability

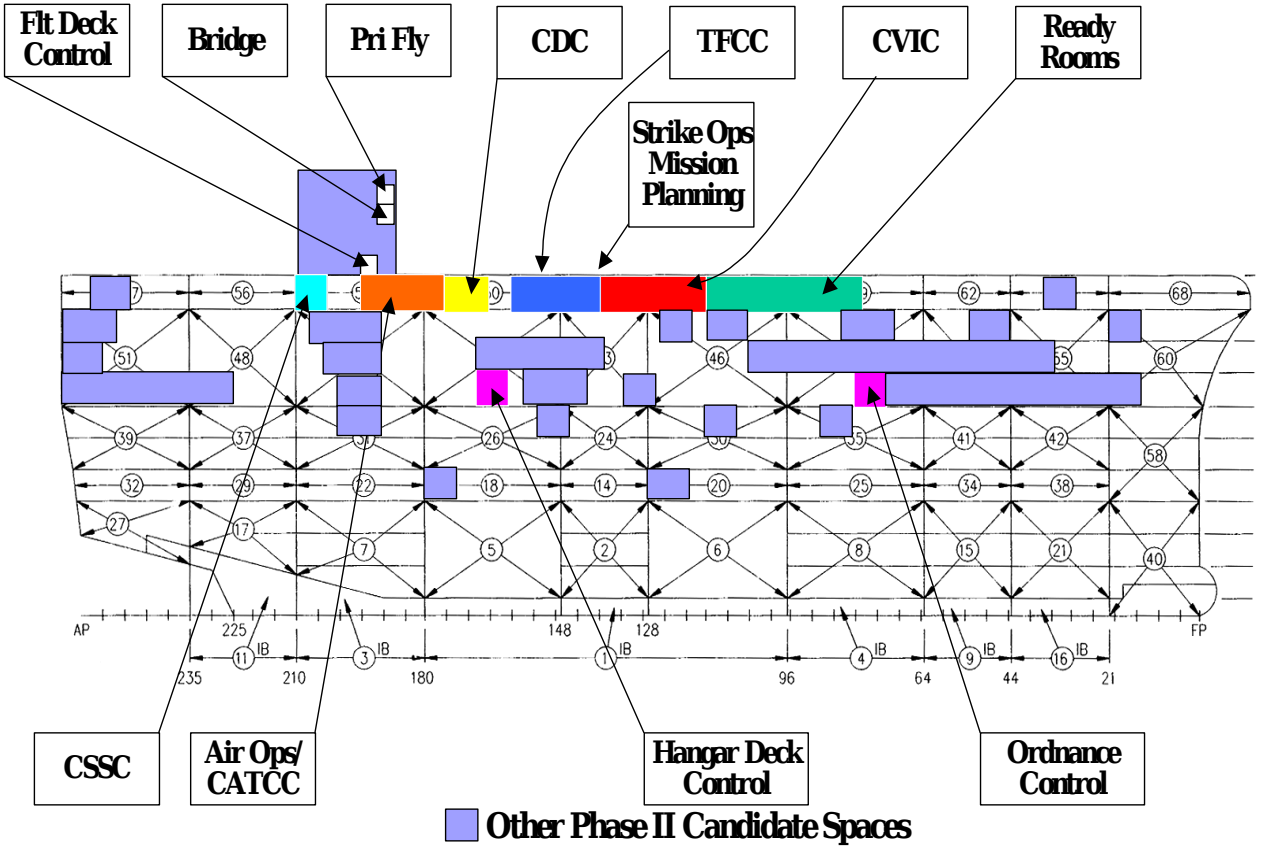
CVN 21 shall be able to reconfigure spaces to meet special or changing mission requirements.

4a2c. (U) Conduct Shipboard Aviation Operations

CVN 21 shall be able to **operate as a Naval Air Operations Center**

4a2d. (U) Warfare System Capability

CVN 21 shall provide the **capability to have a reconfigurable C2 facility.**



	Ship Systems	WS Related
• 26 Electronic/Warfare PARMs	61	61
• 5 Ordnance PARMs	17	5
• 5 HM&E PARMs	13	2

MANY SPACES containing MANY SYSTEMS supporting MANY FUNCTIONS

CVN 21 Command Center Vision

- **Employ E-Business Concepts**
  - ***Portals***
  - ***Data Centers***
  - ***Enterprise Services***
  - ***Thin Client Workstations***
  - ***Adaptable / Scalable***
  - ***Multi Level Secure***

CVN 21 Follow Ship Investment Strategy

Enhanced Weapons / Material Movement

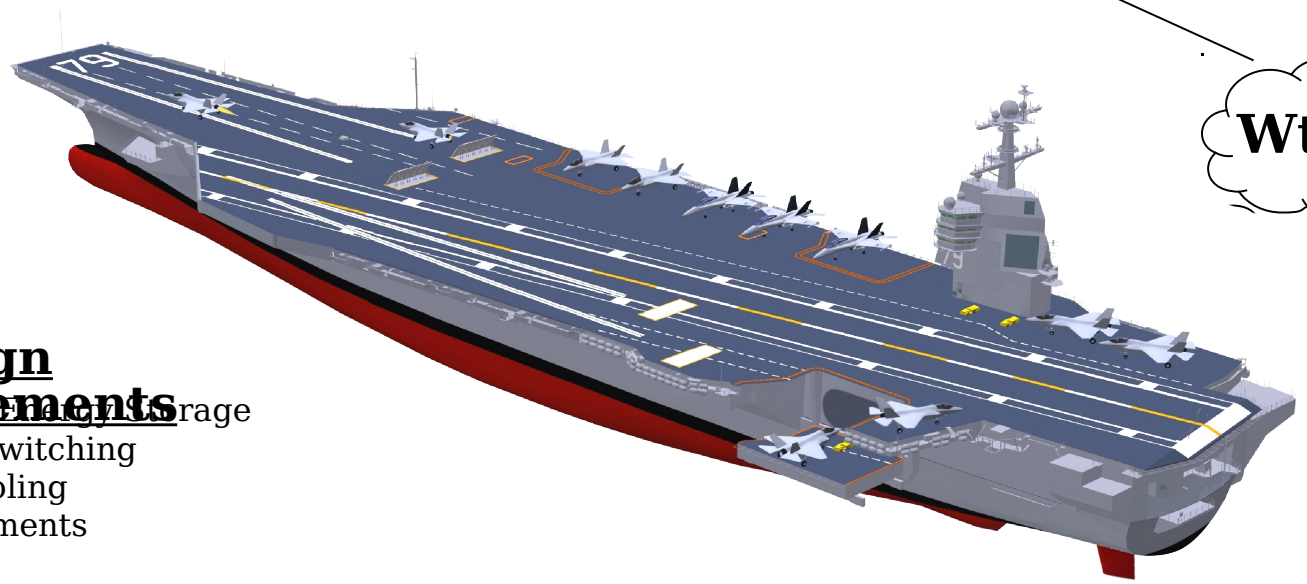
- Advanced Storage and Retrieval System
- Advanced Weapons Movement

Advanced Materials

- Lightweight Materials (Metal/Composites)
- JBD Materials (Eliminate S.W. Cooling)

SGR Manpower

Wt/kg



Design Enhancements

- Consolidated Energy Storage
- High Power Switching
- Advanced Cooling
- Hull Improvements

SGR Wt/kg

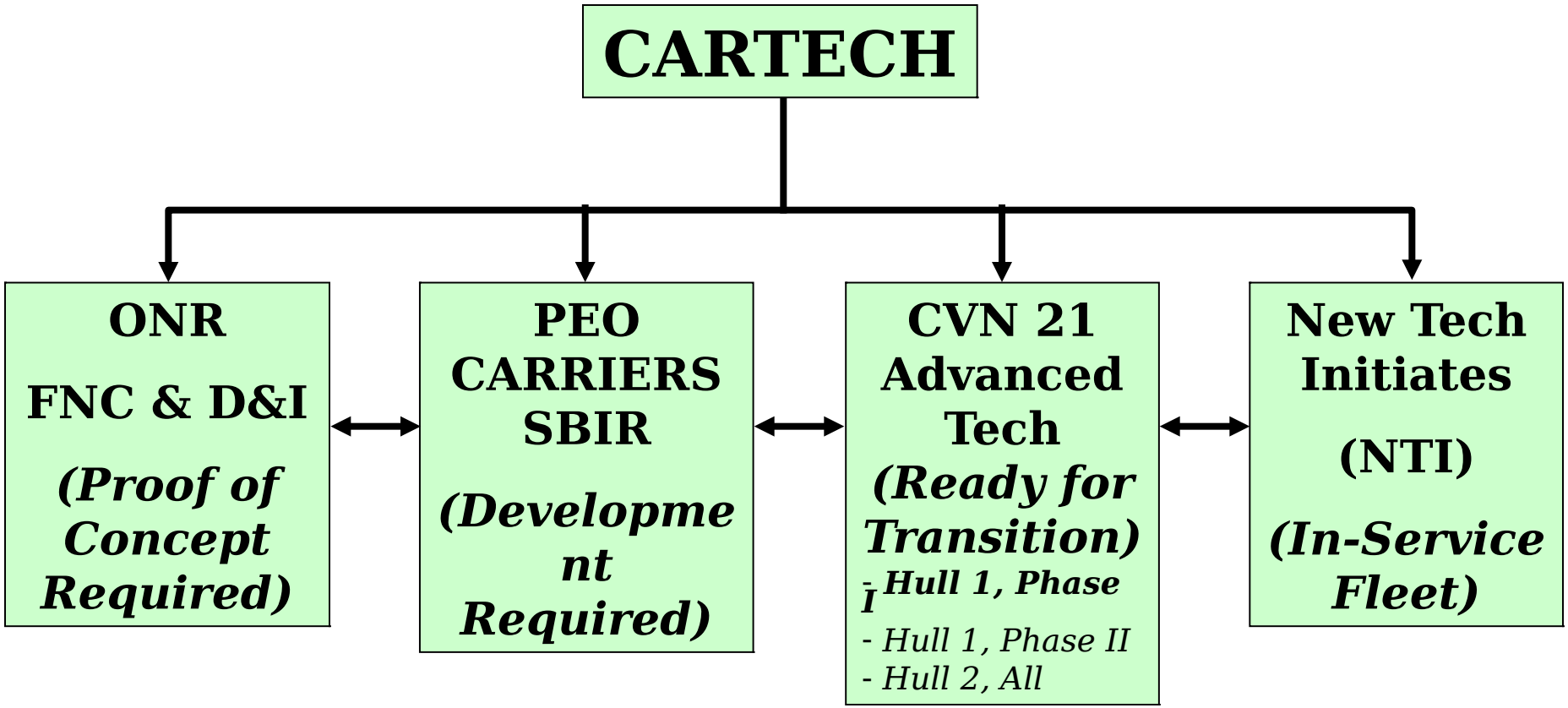
Advanced Ship Self Defense

- Surface Ship Torpedo Defense (SSTD)
- Advanced Point Defense Weapons
- Advanced Force Protection

Improved Survivability

- Advanced Dynamic Armor
- Advanced Damage Countermeasu

Process


CARTECH
ONR
FNC & D&I
(Proof of Concept Required)
PEO CARRIERS SBIR
(Development Required)
CVN 21 Advanced Tech
(Ready for Transition)
- Hull 1, Phase I
- Hull 1, Phase II
- Hull 2, All
New Tech Initiates
(NTI)
(In-Service Fleet)
Level of Matur

Take-A-Ways

- **Numerous opportunities for all types of small businesses**
- **Both short term and long term investments**
- **Large range of improvement needed to address multiple requirements**
- **Opportunities for innovative solution to solve high complex issues**